ANTHROPOLOGY.[1]

Discoveries at Caddington, England, by Mr. Worthington G. Smith.—M. Renach informed the writer at the St. Germain Museum, in 1893, that a hermit was needed in France to live in the Drift Gravel Quarries and pounce upon chipped blades as they were brought to light in the excavations. This was to illustrate the fact that about four-fifths of the alleged paleolithic implements on exhibition in France were either found on the surface and not in place in the gravels, or bought by collectors, professors of geology and curators of museums, as I bought mine from workmen at the gravel pits.

Nevertheless, there is sufficient evidence of a Plistocene blade chipper in western Europe to satisfy the American critic who will take nothing on faith, and the best of this in recent years is embodied in the work of Mr. F. G. Spurrell, who found a stone blade workshop of Plistocene age under drift gravel at Crayford, England, and in the indefatigable explorations of Mr. W. G. Smith at North London (Stoke Newington) and at Caddington, Bedfordshire.

"Man, the Primeval Savage," by Worthington G. Smith, London (Edward Stanford, 27 Cockspur St., Charing Cross, 1894), tells of the striking discoveries made by the latter in some brick-kiln pits on a hill top near Caddington. These cuttings through the drift, discovered by tracing up relic bearing road ballast to its source, and watched for six years, during which time they were often filled with water or abandoned by workmen at critical moments, revealed what Mr. Smith calls a Paleolithic floor or older surface on which rested a stone blade workshop of Plistocene Age. This was covered by a mantle five to ten feet thick, of contorted drift, unfortunately containing no animal remains, that here overspreads the hill, and developed upon examination the following interesting and novel facts·

1. The blade factory was undisturbed, thus presenting an association of artifical objects full of significance and duplicating the results of Mr. Spurrell at Crayford. Other discoverers had found scattered and isolated specimens in the gravel, here the raw material, the blades more or less finished, the chips and the tools lay just as the Post-Glacial workmen had left them.

2. To the envy of the ordinary searcher for isolated objects in the drift, this range of specimens from one place included scrapers worked

[1] The department is edited by Henry C. Mercer, University of Penna, Phila.

on one side, well specialized leaf-shaped blades, either worked all round or sharpened to points, "punches," knife-shaped blades, hammer stones, "anvils," flaked cores and nodules worked in an exceptional way.

3. Discovered blocks of raw material, flint nodules with chalk still adhering to them, showing that the workmen had pulled them out of neighboring flint bearing chalk beds, lay in piles at the site.

4. Several large nodules had been sharpened at one end, leaving the rest of the nodular surface untouched.

5. The hammer stones found were not the numerous oval flint pebbles lying about the site and showing no signs of pounding (though they had been brought to the spot by workmen), but less regular fragments of flint, sometimes knocked into shape and scored with the marks of battering. Sometimes they weighed from five to six pounds.

6. Large flint masses, called by Mr. Smith "anvil stones," were found, showing slight traces of bruising, which, owing to slight doubts of the explorer, were not preserved.

7. The punches discovered were thin, stalactite-shaped nodules, bruised at both ends, weighing sometimes a pound or more, which with "fabricators," pieces of nicked flint used for flaking, in the explorer's opinion, were found mixed with the blade refuse. As opposed to Mr. Smith's view of flaking by means of stone punches and "fabricators," we know that the North American Indians, when working under similar circumstances, used bone, though a relic forger showed the explorer how the Caddington specimens could be accurately reproduced with an iron hammer and a broken gimlet or awl used as a punch.

8. Cores were discovered from which flakes had been worked (a) by careful blows, (b) by smashing with heavy blocks.

9. A beautifully veined pebble, found at the spot, had been brought there as an object of value by the ancient blade workers.

10. Several piles of apparently selected flakes were discovered.

11. A twin flake, held together by a fine, unsplit section, ready to break at a slight jar, was found with the refuse, showing that the workshop site, an area probably covering nearly an acre, had been very gently overspread with the now overlying drift-material, a deposition which had failed to seriously disturb the situation. Mr. Smith, who was present at the brick-pits, at short intervals, for nearly six years, in gathering this remarkable evidence, repeated observations previously made by him at Stoke Newington, Common, London, where, besides duplicates of many of the specimens referred to above, he found two artifically pointed stakes, a scratched log and a chipped blade resting on the scapula of a Mammoth (now on exhibition at the British Mu-

seum). At another place near Caddington, he had found associated with drift blades and in place a horde of two hundred of the bead-like fossils (*Cocinopora globularis*), with holes artificially enlarged, though at none of the sites were drawings on bone, bone needles or lance heads discovered. One of the most interesting features of the work at Caddington consists in what Mr. Smith calls "replacement," a process previously invented by Mr. F. G. Spurrell, and never before, to my knowledge, applied to drift specimens found in situ.

The two thousand two hundred and fifty-nine flakes unearthed at Caddington were grouped according to color on small trays easily shifted from table to table, and a laborious experimental study of them, lasting for three years, demonstrated the interesting fact that many sets of them fitted together, sometimes reconstructing the original nodule on which the blade maker had worked, sometimes hedging about hollows which, on pouring in plaster of Paris, reproduced the form of the resultant and missing blade.

"I examined and re-examined the stones," says Mr. Smith, "almost daily. I looked at them as a relief from other work and at times when I was tired.

"Not only did I keep my selected stones on the tables for this length of time, but I kept a vast number of blocks, rude pieces and flakes, on certain undisturbed grassy places in the brick-fields for the same three years. Whilst working upon my tables, I sometimes suddenly remembered one or more like examples on the grass, and at an early opportunity, fetched them from Caddington. In making up some of the blocks of conjoined flakes, it often happened that one or more interior pieces would be missing. In some cases, these missing pieces were never found, but in other instances, after the lapse of months, or even more than a year, a missing piece would come to light on the paleolithic floor. It is certain that I have not replaced all the flakes in my collection that are capable of replacement—one reason for this is that many flakes are very different in color and markings on one side from what they are on the other, and it is difficult to remember the markings on both sides. Another reason is that the time at my disposal has not been *unlimited*."

All this demonstrates in a manner, as conclusive as it is novel, that the Caddington site is an *undisturbed* workshop, while the analyses of Mr. Smith and the facts described in his work—Man, the Primæval Savage—take precedence over all recent evidence upon the subject, and throw a new light upon the more ancient subdivision of the Stone Age in Europe.

He who has spent earnest hours upon the problems of Plistocene humanity would gladly have seen a department of a museum specially devoted to these unique discoveries and demonstrations, but in a visit to Caddington in 1894, I learned with regret that the series, highly important from its entirety, and not jealously guarded as a whole, had been dissipated for the sake of collectors who wished to illustrate certain phases of Paleolithic blade manufacture with "fine specimens."

Theory, and with it the desire to propound formulæ for the blade-making process in general, yield respectfully to these toilsome investigations and to the persistent ransacking of quarries by a faithful observer whose work alone answers many of the doubts of the American student, and counteracts the questionable impression left upon the mind of the visitors to European museums by rows of typical specimens bought from workmen or gathered upon the surface.

H. C. MERCER.

Recent Explorations of Captain Theobert Maler in Yucatan.—[Extract from a letter received by the editor, December 9th, 1895].—After your departure from Yucatan, I undertook an expedition to the *Peten'Itza* region (Guatemala), crossing the entire pensinula, whose interior or southern part is nearly unknown.

After examining the country around the great Laguna of *Peten'Itza*, I embarked on a small canoe on the Rio Dela Pasión ("which, farther down, is named *Usumutsintla* [Land of Apes, *Usumatli* = with reverence, *Usumatsin* = Ape; *tla* = there is, there are, place of]). Arriving, finally, after many difficulties at Tenosique (State of Tabasco), from whence the traveler finds at his disposition small steamers plying to Laguna del Carmen, and thence by sea to Progresso. On this journey I had the luck to discover and photograph several highly interesting and unknown cities, with remarkable monuments and splendid sculptures, some in the neighborhood of Laguna del Peten, others on the right and left shores of the Rio Pasión (*Usumatsintla*).

On my return to Ticul, I found your letters and also one from Mr. Ashmead, which latter I answered, referring him on the subject of aboriginal Syphilis and Lupus to some passages in the ancient Spanish authors.

As to pottery-making, I have observed that it is the work of women solely, who exercise the art, in my opinion, in the ancient manner serving themselves nearly exclusively with the hands and feet and without special instruments. Here at Ticul, it is easy to see them at work, as the industry is a common one in the suburbs.

My collection of ancient earthen vessels is quite interesting, but as you left Ticul in such a hurry I could not show them to you. Several

of my vases have quadrangular inscriptions, of which I have not yet had time to make photographs. Lately the Globus published accounts of several of my smaller expeditions, accompanied by some twenty photographical illustrations which you may perhaps see in the Globus, Nos. 16 and 18, for 1895.

Some days ago, an earthen vessel, full of little implements of worked stone, was found at a hacienda near Ticul. I have been promised the specimens, and will communicate with you in case they turn out to be of interest. From the cave of *Loltun*, I have several very good photographs *Lol* = *Bejuco*, the Haytian name for hanging plants (the name *Vana* is not used in Mexico); *tun* = stone; *Loltun* = stalactites = hanging stones or stones like hanging plants.

I shall be glad to publish, from time to time, in American scientific or popular journals, small articles describing my Yucateckan discoveries, and when my present work of enlarging photographic negatives is finished, shall be ready to prepare for you a series of accounts of my work, accompanied by the necessary celluloid positives from which it is easy to make reversed negatives for the photolithographic process.

Next year I shall return to the States of Tabasco and Chiapas, where I have still to explore several entirely unknown ruins hidden in the wilderness occupied by the *Lacandones* Indians.

—THEOBERT MALER.

Ticul, November 20, 1895.

SCIENTIFIC NEWS.

The Biological Station of the University of Illinois is first to issue its circular for the summer of 1896. The station staff is composed of Professor S. A. Forbes, Director; Dr. C. A. Kofoid, Superintendent; Frank Smith and Adolph Hempell, Zoological Assistants; Dr. A. W. Palmer and C. V. Millar, Chemists; C. A. Hart, Entomologist and B. M. Duggar, Botanist. The station is situated upon the Illinois River near Havana, Ill., and is equipped with every facility for collection and study. There is a floating laboratory sixty feet long and twenty wide, a steam launch, licensed to carry 17 persons, and all the necessary supplies of tables, microscopes, aquaria, nets, chemicals, etc., as well as a specially selected library. As there are accommodations for only 16 in addition to the station staff, applications for the coming summer will be received only from those who have had sufficient experience to place them beyond the need of continuous supervision in their investigations, and, other things being equal, instructors in biology in colleges and high schools will receive the preference. The station will be open